AMERICAN INSTITUTES FOR RESEARCH

Evaluation of the National Flood Insurance Program

Annual Report 2003-04

Contract Number 282-98-0029
Task Orders #45 and #49

1000 Thomas Jefferson St., NW
Washington, DC 20007-3541
October 2004

The American Institutes for Research (AIR) and its core subcontractors, the Pacific Institute for Research and Evaluation (PIRE) and Deloitte Consulting LLP, are pleased to submit the third annual report on the evaluation of the National Flood Insurance Program (NFIP). Significant progress has been made in the past year. There currently are ten studies underway, each of which addresses one or more of the evaluation's primary questions. AIR and its subcontractors currently are writing reports for many of the studies that began in FY 2002-03. As some studies are being completed, others are just beginning. FY 2003-04 saw the initiation of three new studies addressing the costs and consequences of flooding, state activities in support of the NFIP, and the NFIP's actuarial soundness. Additionally, AIR awarded a subcontract to the University of Maryland to conduct a study evaluating the 1 percent annual chance flood standard (also known as the 100-year flood standard), which began in fall 2004.

AIR has maximized the resources devoted to the evaluation studies while accommodating the need to address appropriately the required management tasks, including the preparation of requests for proposals and statements of work, issuing requests for proposals, evaluating responses and issuing awards, assessing the need for and obtaining clearance from the Office of Management and Budget (OMB), performing and monitoring work, updating the annotated bibliography and chronology, convening meetings of the national steering committee, preparing reports and briefings, and maintaining overall quality control.

AIR created a national steering committee with members whose expertise is critical to the success of the evaluation. AIR periodically has held steering committee meetings to assign priority levels to the research questions and to review the research designs. The third meeting was held in November 2003 in Washington, DC. At the meeting, AIR and its subcontractors presented overviews of the studies and select findings of the evaluation at that point. The meeting also revisited topics identified by steering committee members as important to the evaluation. AIR provides all members of the steering committee with biweekly summaries of the project's status, and each member of the committee is also asked to review statements of work as well as draft reports.

AIR and its subcontractors inform external stakeholders about the evaluation by making presentations at professional conferences. At the annual meetings of the Association of State Floodplain Managers (ASFPM) in 2004, for example, an entire session was devoted to the evaluation and four of its studies: Community Compliance, Measures for Assessing and Evaluating Performance, Minimal Building Standards, and Mapping Anticipated Development. Dr. Richard Tobin (AIR), the evaluation's director, addressed the entire conference at a plenary session. Dr. Tobin also made invited presentations at the annual meeting of the National Flood Determination Association and the Hazards Research and Applications Workshop. He also participated in a forum organized by the ASFPM and the National Academy of Sciences on the 1 percent annual chance flood standard. Subcontractors have presented at various events including the National Flood Conference and the Hazards Research and Applications Workshop.

AIR continues to work on a comprehensive chronology of floodplain management and a searchable annotated bibliography of the NFIP. The 2003 editions of both documents currently are posted on FEMA's website. AIR has updated both documents and plans to make them

available on FEMA's website in November 2004. The 2004 edition of the bibliography contains over 150 more citations than the 2003 edition including many related to international floodplain management.

An integral part of the evaluation requires AIR and its partners to interview private stakeholders, policy owners, and local and state government officials. Before doing so, AIR must obtain approval from the OMB for each study in which more than nine individuals are interviewed. Submission of proposed interview items from several studies to the OMB package was delayed because of several factors including concerns in FEMA's Office of General Council about data collection and respondents' privacy. The delay in submitting the package has been a major impediment to further progress for some studies, but the clearance process is underway currently and we expect the process to be completed after the New Year.

Although the evaluation has been divided into multiple studies, AIR's oversight will ensure all studies contribute to the ultimate goals of the evaluation as a whole. This work involves clarifying and strengthening the studies' relationship to each other. A primary consideration of AIR has been to ensure that all studies address the four ultimate goals of the NFIP (as identified in the 2002 *Design for the Evaluation of the NFIP*): 1) decreased risk of flood losses, 2) reduced costs and adverse consequences of flooding, 3) reduced demands and expectations for federal disaster assistance after floods, and 4) restoration and preservation of the natural and beneficial values of floodplains.

Table 1 lists the studies that AIR and its subcontractors are conducting currently. A detailed description of each of the studies follows.

TABLE 1: NFIP Evaluation Studies, 2003-04

Topic	Status	Lead Organization
Costs and Consequences of Flooding	In Process	PIRE
Environmental and Developmental Impacts of the NFIP	In Process	Walter Rosenbaum (University of Florida)
Evaluating Community Compliance	In Process	AIR (Part A) Dewberry (Part B)
Mandatory Purchase	In Process	AIR
Mapping Anticipated Development	In Process	ABS Consulting
Market Penetration	In Process	RAND Corporation
Measures for Evaluating and Assessing Performance	In Process	PIRE
Minimal Building Standards	In Process	Christopher P. Jones and Associates
The NFIP's Actuarial Soundness	In Process	Deloitte Consulting LLP
State Activities in Support of the NFIP	In Process	AIR
The 1 Percent Annual Chance Flood	In Process	The University of Maryland

Costs and Consequences of Flooding

PIRE initiated work in May 2004 on a study to assess the NFIP's effect on total flood losses; federal, state, and local governments' overall costs of response and recovery; the need for or cost of state and federal disaster relief; and the impact of the NFIP's policies on low-income populations. PIRE is using the HAZUS flood loss model and complementary software that PIRE is developing to determine the total costs of various types of floods and who bears the cost of flooding. To gain further insight into who pays for flooding, PIRE will conduct retrospective community-level case studies about governmental costs and total damages resulting from flood events of varying sizes. PIRE also will analyze the financial impacts of flooding that are not captured in the HAZUS model. These impacts, such as bankruptcies and business discontinuations, will be studied in a sample of actual communities.

Since finalization of the scope of work for the study, PIRE has developed a work plan, initiated a review of literature, and begun selecting communities to include in the study. Communities will be selected to overlap communities in nationally representative community samples studied in other parts of the evaluation. PIRE anticipates submitting a draft of its final report in April 2005.

The NFIP's Environmental and Developmental Impacts

Dr. Tony Rosenbaum of the University of Florida is the lead investigator of a study that is assessing the NFIP's environmental and developmental impacts. The study has summarized literature about the NFIP's impacts on development and environmental quality and assessed the methodologies and rigor of the analysis presented in the literature, has assessed FEMA's compliance with the National Environmental Policy Act (NEPA) and Executive Order 11988, is assessing community perceptions about the role of the NFIP in development, is examining the types of communities pursuing activities to enhance the natural and beneficial uses of floodplains as part of the Community Rating System (CRS), and is identifying and evaluating litigation in which the NFIP is alleged to have encouraged development of habitat protected by the Endangered Species Act.

Dr. Rosenbaum is collecting documents related to FEMA's compliance with Executive Order 11988 and NEPA. He has interviewed environmental officers in the ten FEMA regional offices, as well as with FEMA's environmental officer at headquarters. In August 2004, Rosenbaum completed and submitted to FEMA a final draft of the review of literature, which was reviewed by three external reviewers plus FEMA staff. Dr. Rosenbaum participated in a panel discussion on the NFIP evaluation at the Hazards Research and Applications Workshop in Boulder, CO. Dr. Rosenbaum is continuing his assessment of community perceptions about the role of the NFIP in development. Interview protocols were developed, and AIR, FEMA, and the Florida Survey Research Center reviewed them. These protocols currently are awaiting clearance from OMB.

Evaluating Community Compliance

AIR is assessing the processes that affect community compliance with NFIP regulations. AIR anticipates submitting the draft report to FEMA in January 2005. The draft report examines the NFIP's model for determining violations through Community Assistance Visits and Community Assistance Contacts, discouraging violations through training and technical assistance, remedying violations, and imposing enforcement actions on communities that do not comply with NFIP regulations. The report also contains an analysis of monitoring compliance in communities participating in the CRS. The report highlights several potential disconnects or problematic issues in the compliance process, such as variances, substantial damage and improvement declarations, and the use of submit-for-rates. AIR presented some initial findings to FEMA in November 2003. AIR presented additional initial findings regarding compliance in CRS communities at a meeting of the CRS Task Force in July 2004.

Dewberry is assessing the percentage of post-FIRM structures in SFHAs, both insured and uninsured, that are in compliance with the NFIP's floodplain management regulations related to construction and elevation relative the base flood elevation. Dewberry has worked with AIR and FEMA to choose 15 community clusters, from which a random sample of communities and structures within those communities has been selected to be examined for compliance. Dewberry aims to survey a sufficient number of communities and structures to allow inferences to be made about the rate of compliance with NFIP building requirements within similar geographic areas, communities, flooding conditions, and building types. Dewberry completed a pilot test of the first community cluster, the Washington DC-Baltimore MD cluster, in early 2004. Following completion of the pilot test, Dewberry began its study of nine other clusters. As of September 2004, Dewberry has completed the fieldwork in 25 communities, or five clusters, and conducted physical surveys on 625 structures. Dewberry anticipates completion of the fieldwork by January 2005. To date, Dewberry has submitted interim reports to FEMA on three of the clusters studied, including the Florida West Coast, Florida Panhandle, and Louisiana. Upon completion of ten clusters, FEMA will decide if it wishes to gather additional information from the five remaining clusters.

Coordination between AIR and Dewberry has involved joint meetings, overlapping work plans, and shared sites for data collection. Additionally, Dewberry will review the upcoming draft report for Community Compliance Part A to ensure that Part A's conclusions are consistent with the findings in Part B. Although AIR anticipates completing a draft report for Part A in early 2005, the final version of the report for Part A will be released with Part B's report in mid 2005.

Mandatory Purchase

AIR is providing a comprehensive analysis of the processes that come into play to require the purchase and renewal of flood insurance on structures in SFHAs with loans: a) from federally regulated lenders; b) that are insured, subsidized, or guaranteed by federal agencies; or c) that are sold or transferred to a government-sponsored enterprise.

AIR completed a draft report on the topic in late 2003. The report identifies the legal roles and responsibilities of all parties, including banks, regulators, property owners, insurance companies and agents, and others; the procedures used to comply with the legal requirements; areas of overlap and duplication; and any gaps in the law or its implementation, which may result in noncompliant loans and structures. AIR solicited comments on the draft report from FEMA and a variety of stakeholders in the requirement. AIR received comments from multiple agencies including FEMA, six federal agencies for lending regulation, Fannie Mae, Freddie Mac, the Department of Housing and Urban Development, the Farm Credit Administration, and the National Lenders Insurance Council. AIR currently is revising and updating the report in response to the many comments received. AIR anticipates submitting a revised report to FEMA in October 2004 to solicit comments. The report also will be sent to all members of the evaluation's steering committee and to all agencies that were interviewed.

Mapping Anticipated Development

In December 2002, ABS consulting began work on a study to assess the costs and advantages of reflecting anticipated development in Flood Insurance Rate Maps. The report will draw on data collected in and about a series of case study communities, as well as on interviews conducted with FEMA, the ASFPM, stakeholders in the communities and in mapping, and the insurance agents within the pilot communities. ABS will capture local future conditions and current conditions hydrology from previously prepared studies for each community included in the case studies and estimate damage by varying degrees of flood events using the HAZUS flood model methodology. The study also involves a review of literature regarding research on issues that will affect the costs and advantages of mapping the hydrology of future conditions. Case study communities include Mecklenburg County, NC; Escambia County, FL; Fort Collins, CO; and Harris County, TX. Grand Forks, ND initially was included as a case study. However, due to lack of reliable data and the expectation that a new dike represents the future condition, Grand Forks no longer is included in the study. An additional community (DuPage County, IL) was added to the case studies in December 2003. The communities included in the study vary by type of watershed (riverine and coastal), size of watershed, population growth, and population growth. Some of the communities studied already have mapped future conditions hydrology whereas others have not. ABS has completed interviews and data collection in four communities and has completed data analysis for Mecklenburg County, Harris County, and Fort Collins. ABS completed its review of literature, which it submitted to FEMA in July 2004. ABS is near completion of a draft of the final report for the study. The draft has been delayed due to complications securing data from DuPage County.

Market Penetration

RAND initiated a study on market penetration in November 2002. The study will estimate the percentage of single family homes in SFHAs that have flood insurance and the rate of compliance with the mandatory-purchase requirement. The study also will examine the relationship between market penetration and federal disaster assistance and the relationship between market penetration and various measures of community compliance with the requirements of the NFIP. The results will be used to better understand the benefits and costs of increasing market penetration and to identify opportunities for policy growth.

RAND has developed preliminary estimates of market penetration by geographic region, community size, and CRS participation. One of the most noteworthy findings is the low market penetration rate in small NFIP communities. RAND is exploring possible explanations for this finding. RAND is also refining its logistic regression analysis of the determinants of market penetration. Analyses of the geographic correlation of losses, the relationship between market penetration and disaster assistance, and the relationship between community compliance with the NFIP and market penetration are proceeding. Interim findings from the study were presented at the National Flood Conference in Seattle and at the Hazards Research and Applications Workshop in Boulder, Colorado.

RAND currently is analyzing the data it has collected and working on a draft of the report for the study. This work includes interviewing informed stakeholders to help interpret statistical findings and to better understand opportunities for increased market penetration. RAND anticipates completing a draft report in November 2004.

Measures for Evaluating and Assessing Performance

The purpose of this study, conducted by PIRE, is to evaluate the performance assessment and evaluation measures used by the NFIP and to recommend improvements, if appropriate. The study will be conducted in two phases, focusing first on current measures, and later on how the measures fit into the overall evaluation.

At FEMA's request, PIRE will focus its initial report on performance measures derived from key informant interviews. PIRE has completed its interviews with key informants and collated their responses in a matrix of proposed performance measures. In total, PIRE interviewed 15 key informants including management staff from FEMA headquarters and its regional offices, FEMA's Office of Inspector General, the General Accounting Office, the Congressional Budget Office, select members of the NFIP evaluation Steering Committee, a state flood insurance coordinator, and a representative of the insurance industry. PIRE also interviewed six members of the AIR evaluation team. PIRE currently is working on a draft of its initial report, which it expects to complete in late October 2004.

Minimal Building Standards

This study is evaluating the NFIP's building standards through a review of literature, review of flood loss and damage data for structures and communities, and calculation of costs and benefits of modifying the NFIP's building standards across defined ranges of flood conditions and building configurations differentiated by flood hazard zone.

As part of the study's coastal A zone analysis at Topsail Beach, NC, ABS consulting completed GIS calculations that resulted in island-wide estimates of ground elevations and flood depths and conditions associated with Hurricane Fran. These calculations are being used in the depth-damage analysis. A member of the evaluation team completed the collection of building valuation and other building data from Onslow and Pender Counties, North Carolina. Jones has developed a building data sheet format and has begun the final depth-damage calculations.

Progress also has been made on generic building cost and damage calculations. Comments were received on preliminary building design and cost calculations at a meeting of the study's expert panel in December 2003. Building design and cost calculations for a variety of buildings in A zones, coastal A zones, and V zones were revised and completed. A member of the study's expert panel performed independent design calculations for 10 percent of the V zone pile foundation cases and found good agree results for use in the economic calculations comparing the costs and benefits of modifying the NFIP's foundation and floor elevation requirements. Michael Baker, Jr., Inc. developed, at no cost to the evaluation, a procedure to estimate n-yr riverine flood depths, given the 100-yr flood depth. The procedure will be used in the study's economic calculations.

Data collection, analysis and report preparation have been much slower than planned during the year, due primarily to Jones' involvement in a FEMA project to develop coastal flood mapping *Guidelines and Specifications* for the Pacific coast. It is anticipated that the Building Standards draft report will be complete in late 2004.

State Activities in Support of the NFIP

In April 2004, FEMA approved the scope of work for a study to improve understanding of how state agencies implement their responsibilities for floodplain management and, therefore, how state agencies affect whether the NFIP meets its goals. The study will focus on whether the role the NFIP created for the states is the best to accomplish the program's goals and on the interaction between the states and FEMA in serving those roles. As lead agency in the study, AIR will conduct interviews with state officials with primary responsibility for floodplain management, as well as with representatives from other state agencies (such as state prisons; public universities; transportation departments and their highway offices; and housing, community, and economic development agencies). The interviews will culminate in a series of case studies that will explore a range of experiences with floodplain management at the state level and seek helpful models and practices in floodplain management among these actors. The case studies also will explore helpful models and practices between state-level entities and both their federal counterparts and the communities they serve. The study will build on the lessons and information already developed under the ASFPM's *Effective State Programs* and *Floodplain Management 2003: State and Local Programs* to prevent duplication of effort. The study is designed to provide preliminary insights rather than generalizable results or an enumeration of state-level activities. It will be used to evaluate potential changes to the NFIP and the proper roles of the states rather than to evaluate the performance of the state agencies themselves.

The 1 Percent Chance Annual Flood Standard

In October 2004, a team lead by Gerald Galloway from the University of Maryland initiated a study to evaluate the 1 percent annual chance flood standard. The study will both assess the adequacy of the current 1 percent annual chance flood standard and address the possible impacts of changing the standard. It will determine the implications of making the 1 percent chance standard a threshold for mandatory insurance purchase and flood management ordinances and assess whether the standard is adequate in reducing risk from flood losses. The

study will also consider what effects a change in the standard would have on flood losses avoided, property values, NFIP loss experience, map modernization efforts, map revision and amendment costs, insurance sales, insurance rates, and federal flood disaster expenses in areas that face flood hazards below the 1 percent annual probability threshold. Finally, the study will consider ways to improve the use of the current 1 percent chance standard or restrictions associated with the standard.

AIR and the University of Maryland began work on the study by attending the first Forum on Floodplain Management, which the ASFPM organized at the National Academy of Sciences in September 2004. Stakeholders from government, industry, and academia were present at the forum to discuss and analyze the adequacy of the 1 percent annual chance flood standard.

The NFIP's Actuarial Soundness

Deloitte Consulting LLP began work on a study assessing the NFIP's actuarial soundness in April 2004. An examination of whether actuarial soundness should be one of the NFIP's goals, the NFIP's progress in moving towards actuarial soundness, and the inherent impediments to meeting such a goal is critical in evaluating the viability of actuarial soundness for the NFIP. Deloitte will compare and contrast the NFIP's current approach to ratemaking with best practices observed in the property and casualty insurance industry to define actuarial soundness in the context of the NFIP and determine the indicators and measurements that might be used to assess actuarial soundness. The evaluators then will interview current and former NFIP staff to determine what the NFIP's goals are with respect to achieving actuarial soundness and how social, floodplain management, or other NFIP objectives affect such a goal. Issues that will be researched include the phasing out of subsidized premiums, approaches to phasing out the subsidy (e.g., stair step versus shock), the impact of the perception of "government bailouts," grandfathering properties that have been remapped from low-risk zones to high-risk zones, and repetitive loss properties. Deloitte will use the data it collects to assess whether actuarial soundness is an appropriate goal for the NFIP. Deloitte also will assess the progress that the NFIP has made in reaching actuarial soundness and will suggest ways that the NFIP can overcome any impediments towards reaching actuarial soundness. Deloitte currently is conducting background research by reviewing past research conducted by FEMA, AIR, Deloitte, and other stakeholders and is analyzing data on flood insurance rates and claims acquired from FEMA in July.

Summation

AIR and its partners have had a full and productive year. We are well on our way to issuing several reports we hope will provide useful insights for maintaining and improving the NFIP.

Despite the progress, we must also note that several of the studies are behind schedule. In each instance, the studies are requiring more time than investigators had anticipated and are encountering unforeseen delays or obstacles in gathering the required data. For example, in the study on Mapping Anticipated Development, communities were selected on what turned out to

be unreliable information about data availability. Although a community selected as a replacement agreed to participate in the study, the community's contractor has refused to provide our team with the information requested. The community has had to seek the intervention of the state's attorney to force release of the data. This has been a time-consuming process.

AIR seeks to ensure the timely completion of all studies as well as that of the overall evaluation. Nonetheless, AIR also wants to ensure the integrity of the studies as well as their overall quality. Where timeliness and quality are in conflict, AIR works with FEMA to make decisions about time priorities while maintaining research quality. AIR continues to make aggressive efforts to improve timeliness and maintain quality.